

TSMC-02-212

February 9, 2004



To: Commissioner for Patents
P.O.Box 1450
Alexandria, VA 22313-1450

Fr: George O. Saile, Reg. No. 19,572
28 Davis Avenue
Poughkeepsie, N.Y. 12603

Subject: | Serial No. 10/714,998 11/17/03 |
Bang-Chien Ho et al.
WATER SOLUBLE NEGATIVE TONE
PHTOTRESIST
| _____ |

INFORMATION DISCLOSURE STATEMENT

Enclosed is Form PTO-1449, Information Disclosure Citation
In An Application.

The following Patents and/or Publications are submitted to
comply with the duty of disclosure under CFR 1.97-1.99 and
37 CFR 1.56.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being
deposited with the United States Postal Service as first class
mail in an envelope addressed to: Commissioner for Patents,
P.O. Box 1450, Alexandria, VA 22313-1450, on February , 2004.

Stephen B. Ackerman, Reg.# 37761

Signature/Date Stephen B Ackerman 2/12/04

U.S. Patent 5,573,634 to Ham, "Method for Forming Contact Holes of a Semiconductor Device," discusses a method of forming smaller contact holes by a double exposure process.

U.S. Patent 5,017,461 to Abe, "Formation of a Negative Resist Pattern Utilize Water-soluble Polymeric Material and Photoacid Generator," describes a water soluble negative tone composition based on a polyvinyl alcohol (PVA) and an acid generator that is a diazonium salt.

U.S. Patent 5,998,092 to McCulloch et al., "Water Soluble Negative-working Photoresist Composition," discusses a water soluble negative resist that does not rely on a crosslinking mechanism.

U.S. Patent 5,948,592 to Umehara et al., "Water-soluble Photoresist Composition," describes a water soluble resist that is compatible with a crosslinking mechanism.

U.S. Patent 5,532,113 to Frechet et al., "Method of Making Microelectronic Structures Utilizing Photoresists Containing C3C12 Water Soluble Sugar Crosslinking Agents," discusses a photoresist including crosslinking agents, and crosslinking agents for such formulations.

U.S. Patent 5,536,616 to Frechet et al., "Photoresists Containing Water Soluble Sugar Cross-linking Agents," discusses photoresists including crosslinking agents, and crosslinking agents for such formulations.

U.S. Patent 5,648,196 to Frechet et al., "Water-soluble Photoinitiators," describes a water soluble photoacid generator (PAG) .

U.S. Patent 5,858,620 to Ishibashi et al., "Semiconductor Device and Method for Manufacturing the Same," discusses a crosslinking formulation in which a water soluble polymer and crosslinker are coated on a patterned layer containing acid that has a hole with a space width of about 400nm.

U.S. Patent 6,319,853 to Ishibashi et al., "Method of Manufacturing a Semiconductor Device Using a Minute Resist Pattern, and a Semiconductor Device Manufactured Thereby," describes a crosslinking mechanism to shrink a 200 nm space to a 110 nm space width.

Co-pending U.S. Patent TSMC-01-376, "Improvement of Contact Hole Printing by Packing and Unpacking," Serial # 10/002,986, filed on 11/30/01, assigned to the same assignee, discusses a method of improved contact hole creation for ultra-small contact holes.

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U.S. Patent TSMC-01-463, Serial # 10/005,806, filed on 12/05/01, now issued as US 6,664,011, "Hole Printing by Packing and Unpacking Using Alternating Phase-shifting Masks," to Lin et al., discusses a method for the creation of contact holes.

Co-pending U.S. Patent TSMC-02-162, Serial # 10/443,359, filed on 05/22/03, "Water Soluble Negative Tone Photoresist," assigned to the same assignee, discusses the particular chemistries for negative photoresist.

Co-pending U.S. Patent TSMC-02-211, Serial # 10/268,586, filed on 10/10/02, "Method for Preventing the Etch Transfer of Sidelobes in Contact Hole Patterns," assigned to the same assignee, discusses a method of forming a pattern in a substrate that is free of surface damage or divots caused by an etch transfer of sidelobes from a photoresist layer.

Sincerely,

A handwritten signature in cursive script, reading "Stephen B. Ackerman".

Stephen B. Ackerman,
Reg. No. 37761

Form PTO-1449

Document Number (Optional)

Application Number

TSMC-02-212

10/714,998

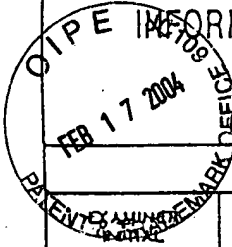
Applicant

Bang-Chien Ho et al.

Filing Date

11/17/03

Group Art Unit



INFORMATION DISCLOSURE CITATION
IN AN APPLICATION

(Use several sheets if necessary)

U. S. PATENT DOCUMENTS

DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
5573634	11/12/96	Ham	156	659.11	12/22/94
6664011	12/16/03	Lin et al.	430	5	12/5/01
5017461	5/21/91	Abe	430	325	3/13/89
5998092	12/7/99	McCulloch et al.	430	270.1	5/27/98
5948592	9/7/99	Umehara et al.	430	270.1	7/7/98
5532113	7/2/96	Frechet et al.	430	296	9/21/95
5536616	7/16/96	Frechet et al.	430	191	9/21/94
5648196	7/15/97	Frechet et al.	430	270.1	7/14/95
5858620	1/12/99	Ishibashi et al.	430	313	1/24/97
6319853	11/20/01	Ishibashi et al.	438	780	3/29/00

FOREIGN PATENT DOCUMENTS

DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
					YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

-	Co-pending U.S. Patent TSMC-01-376, Serial # 10/002,986, filed on 11/30/01, same assignee, "Improvement of Contact Hole Printing by Packing and Unpacking."
-	Co-pending U.S. Patent TSMC-02-162, Serial # 10/443,359, filed on 05/22/03, same assignee, "Water Soluble Negative Tone Photoresist."

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

FEB 17 2004

(Do several shows if necessary)

Application Number

10 | 714,998

Bang-Chien Ho et al.

11/17/03

Group Art Unit

**ZAMNE
NADLE**

DOCUMENT NUMBER

DATE

NAME

class

WBCLES

PLUMB DATE
IF APPROPRIATE

DOCUMENT NUMBER

DATE

COUNTRY

CLASS

SUBCLASS

Translation

YES

NO

DOCUMENT NUMBER

DATE

COUNTRY

CLASS

SUBCLASS

Translation

YES

NO

Co-pending U.S. Patent TSMC-02-211, Serial # 10/268,586, filed on 10/10/02, same assignee, "Method for Preventing the Etch Transfer of Sidelobes in Contact Hole Patterns."

ΕΛΛΗΝΙΚΗ

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.